

REMARKS

In the Office Action of September 14, 2005, the Examiner rejected claims 48-98 under several references that will be individually discussed in the sections below. This paper amends claims 48, 50, 52, 57, 60, 65, 68, 75-77, 86, 88, and 93. Reconsideration of the application in view of the amendments is respectfully requested.

Section 112 Rejections

The Examiner rejected claims 48-98 under 35 U.S.C. § 112, first paragraph, as failing to comply with the written description requirement.

The Examiner rejected claim 48, citing the terms “integral to a portion,” “identical sequences of layers,” and “substantially the same thickness.” Applicants have amended claim 48, incorporating the claim language recommended by the Examiner and eliminating the phrase “integral to a portion.”

The Office also asserts that the “substantially the same thickness” limitation is not supported by the specification. Applicants respectfully disagree. In the application as filed, figures 3-5 and the text describing those figures (from page 5, line 27 to page 8, line 4) describes how the bypass device is constructed by etching a sequence of epitaxially deposited layers forming a single or “integral” semiconductor structure so that the remaining layers after etching in one region form a bypass diode, and the remaining layers in the other region after etching form a multijunction solar cell, both regions being in a single semiconductor structure. Therefore, inherent as a result of the manufacturing process is the fact that the layers of the bypass device have substantially the same composition and thickness because the bypass

device and the subcell were formed from the same layers before etching, and the thickness of the remaining layers is not changed by the etching. Applicants respectfully request the removal of this rejection.

The Examiner rejected claim 52, citing the terms “integral to a portion,” “identical sequences of layers,” and “substantially the same thickness.” Applicants have amended claim 52, incorporating the claim language recommended by the Examiner and eliminating the phrase “integral to a portion.” With respect to the “substantially the same thickness” rejection, Applicants refer to the argument presented above with respect to claim 48.

The Examiner rejected claim 57, citing the terms “integral to a portion,” “identical sequences of layers,” and “substantially the same thickness.” Applicants have amended claim 57, incorporating the claim language recommended by the Examiner and eliminating the phrase “integral to a portion.” With respect to the “substantially the same thickness” rejection, Applicants refer to the argument presented above with respect to claim 48.

The Examiner rejected claim 60, citing the terms “integral to a portion,” “identical sequences of layers,” and “substantially the same thickness.” Applicants have amended claim 60, incorporating the claim language recommended by the Examiner and eliminating the phrase “integral to a portion.” With respect to the “substantially the same thickness” rejection, Applicants refer to the argument presented above with respect to claim 48.

The Examiner rejected claim 65, citing the terms “identical sequences of layers” and “substantially the same thickness.” Applicants have amended claim 65, incorporating the claim language recommended by the Examiner. With respect to the “substantially the same

thickness” rejection, Applicants refer to the argument presented above with respect to claim 48.

The Examiner rejected claim 67, citing the term “at least one cell.” Applicants assert that Figure 1 shows support for claim 1, because at least one of the cells shown in Figure 1 is fabricated from GaAs.

The Examiner rejected claim 68, citing the terms “identical sequences of layers” and “substantially the same thickness.” Applicants have amended claim 68, incorporating the claim language recommended by the Examiner. With respect to the “substantially the same thickness” rejection, Applicants refer to the argument presented above with respect to claim 48.

The Examiner rejected claim 77, citing the terms “identical sequences of layers” and “substantially the same thickness.” Applicants have amended claim 77, incorporating the claim language recommended by the Examiner. With respect to the “substantially the same thickness” rejection, Applicants refer to the argument presented above with respect to claim 48.

The Examiner rejected claim 88, citing the terms “identical sequences of layers” and “substantially the same thickness.” Applicants have amended claim 88, incorporating the claim language recommended by the Examiner. With respect to the “substantially the same thickness” rejection, Applicants refer to the argument presented above with respect to claim 48.

The Examiner rejected claim 93, citing the terms “identical sequences of layers” and “substantially the same thickness.” Applicants have amended claim 93, incorporating the

claim language recommended by the Examiner. With respect to the “substantially the same thickness” rejection, Applicants refer to the argument presented above with respect to claim 48.

The Examiner rejected claims 48-98 under 35 U.S.C. § 112, second paragraph, as being indefinite. With respect to the “substantially the same thickness” rejection, Applicants refer the Examiner to the argument presented above with respect to claim 48.

The Examiner rejected claim 75, stating that the term “as” should be “and.” Applicants have amended claim 75 to correctly reflect change suggested by the Examiner.

The Examiner rejected claim 77, stating that the term “said” is unclear. Applicants have amended claim 77 to clarify the meaning of the claim.

The Examiner rejected claim 68, stating that the term “as” should be “and.” It appears that the Office Action contained a typographical error and this rejection should apply to claim 86. Applicants have amended claim 86 to correctly reflect change suggested by the Examiner.

Section 102 Rejections

A) JP ‘397 Reference

The Office rejected claims 48-66, 68-70, 72-73, 75-78, 80, 84, 86-90, and 92-98 under 35 U.S.C. § 102(b) as being anticipated by JP ‘397. Applicants respectfully traverse this rejection.

Applicants assert that, in order for a reference to satisfy the requirement for “an identical sequence of layers,” the reference must disclose an identical sequence of layers (*i.e.*,

layers with identical respective composition and thickness) in both the solar cell portion and the bypass diode portion. The '397 reference fails to meet either requirement.

The figure in the '397 reference shows a solar cell with layers numbered 107, 106B, 105B, 104B, 106A, 105A, and 104A. The bypass diode in the '397 reference shows layers numbered 108D, 107D, 104D, and 105D. Thus, there is no layer that corresponds to layer 106 in the bypass diode. In addition, the solar cell shows seven different layers, while the bypass diode only shows four different layers. Therefore, the bypass diode and the solar cell of the '397 reference do not have an identical sequence of semiconductor layers.

Applicants have amended independent claims 48, 52, 57, 60, 65, 68, 77, 88 and 93 to further clarify the structure of the bypass diode and the solar cell.

Applicants assert that, because all of the independent claims are distinct from the JP '397 reference, all of the pending claims (48-98) are allowable over JP '397 and respectfully request the removal of this rejection.

B) Taylor Reference

The Office rejected claims 48-66, 68-70, 72, 73-78, 80, 84-90, and 92-98 under 35 U.S.C. § 102(b) as being anticipated by Taylor, GB 2346010A. Applicants respectfully traverse this rejection.

The Office stated that Figures 1C and 1D and pages 5 and 6 of Taylor set forth the features of the instant solar cell semiconductor device. Applicants previously argued that the protection diode of Taylor does not appear to be electrically connected to the solar cell. The Office did not find those arguments persuasive. In the section titled Response to Arguments,

the Examiner stated that Taylor's protective diode 11 and solar cell 5 share layer 7, which is electrically conductive and thus, the protective diode 11 and solar cell 5 are connected internally. Applicants respectfully disagree and point to page 5, line 13 of Taylor, which states that the trench in Figure 1C serves to "isolate" protection diode 11. Furthermore, while the Examiner states that layer 7 is shared, Figure 1C shows that the etch goes through layer 7, such that layer 7 is not shared. (See also page 5, lines 12-14, which state that the trench is etched to layer 7.)

Applicants therefore assert that all of the pending claims are distinct from the Taylor reference and respectfully request the removal of this rejection.

C) Ho Reference

The Office rejected claims 48-59 and 65-92 under 35 U.S.C. § 102(b) as being anticipated by Ho et al., WO 99/62125. In the section titled Response to Arguments, the Examiner states that claim 48 is silent concerning a bottom subcell. Applicants have amended claim 48 to recite a bottom subcell. The Examiner also states that the GaAs subcell in Figure 14B reads on the instant subcell. Applicants respectfully disagrees. The Ho reference refers to Ge emitter and Ge base as the bottom subcell. See, for example, page 4, line 9, which states, "[t]he base layer 106 and the emitter layer 108 together form a lower cell stage." As stated at page 8, line 9, "[t]he exemplary grown layer sequence illustrated in Figure 14A is similar to that of Figure 1A." Applicants therefore assert that layers 1402 and 1404 form the bottom subcell in Figure 14A. Because diode 1410 overlies layers 1402 and 1404, it is clear that Ho does not anticipate the present invention.

The Examiner states that the GaAs subcell “is a bottom subcell that is clearly formed on germanium substrate 1402.” Applicants respectfully refer to the argument in the preceding paragraph—layer 1402 is a part of a lower subcell with layer 1404. Therefore, the GaAs of Ho is not formed on a substrate, it is formed on another cell, making the GaAs cell not the bottom subcell.

The Examiner states that “Claim 52 is so broadly worded that there is nothing in instant claim 52 that excludes a bottom subcell being on a substrate which may or not have a subcell.” Applicants respectfully disagree. Applicants have amended claim 52 such that it is clear that the bottom subcell is formed *in* the substrate. Because there is a subcell (layers 1402 and 1404) between the GaAs cell and the substrate, Applicants assert that claim 52 is allowable over Ho.

With respect to claim 60, the Examiner states that C-clamp 1442 is a layer and thus reads upon claim 60. Applicants respectfully point out that claim 60 recites a “*deposited metal* layer.” It is readily apparent from Figure 14B that C-clamp 1442 is not deposited onto the semiconductor structure and actually protrudes from device 1400. Thus, the C-clamp is not a deposited metal layer, and Applicant asserts that claim 60 is allowable over Ho.

Applicants therefore assert that all of the pending claims are distinct from the Ho reference and respectfully request the removal of this rejection.

Section 103 Rejections

The Office rejected claims 48-98 under 35 U.S.C. § 103(a) as being unpatentable over Taylor in view of Marvin et al., and Lillington et al., U.S. Patent 5,853,497. For the reasons

set forth above with respect to Taylor, Applicants assert that Taylor in combination with Marvin and Lillington also fails to anticipate or render unpatentable any of the claims in the present invention. More particularly, the combination of Taylor with Marvin and Lillington still fails to disclose each aspect of the present invention. Applicants respectfully requests the removal of this rejection.

The Office rejected claims 48-98 under 35 U.S.C. § 103(a) as being unpatentable over Ho et al., WO 99/62125. For the reasons set forth above with respect to Ho, Applicants assert that Ho fails to anticipate or render unpatentable any of the claims in the present invention. Applicants respectfully requests the removal of this rejection.

CONCLUSION

Applicants assert that all of the claims in the present application are allowable over the cited references. If there are any additional charges concerning this response, please charge to White & Case LLP Deposit Account 23-1703.

A favorable consideration of the present amendment together with the original application is respectfully requested.

Respectfully submitted,

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By: 

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